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ABSTRACT

The assumption that the dyadic communication pattern (one teacher-one student) is the most effective pattern for encouraging language and speech development among elementary and preschool children is tested in this study. Fifty-six 4-year-old children from the Task Force Head Start Program of Buffalo, New York, were observed in four different communication patterns and the mean length of their verbalizations was recorded. Also noted was the interaction of sex with each of the conditions. The patterns used were the dyad, the triad (1 experimenter and 2 children), the small group (1 experimenter and 3 children), and the role-playing triad (same as triad, but with children encouraged to act out roles). Analysis of the data revealed no significant inter-pattern differences in mean verbalization length, except that the small group elicited a statistically greater amount of speech than did the dyad (both with repetitions left in and with repetitions deleted). With and without repetitions, girls produced significantly more speech than boys. While the actual difference between the speech from the small group and from the dyad is small (less than one word per response), findings are important because they demonstrate that the dyadic situation may not be justified in terms of speech development, particularly since it is less economical of the teacher's time. (MH)

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A. Introduction and Purpose of Study

Public and private agencies across the country are currently involved in preparing young, socioeconomically deprived children for the public school system. There is an attempt made in these programs to accelerate the language development of the children which has sometimes been labelled as underdeveloped (Deutsch, 1965). There are various assumptions which support the idea that the deprived child's environment is inadequate for language development and thus must be supplemented prior to his entrance into public school. Some psychologists feel that ghetto children do not receive sufficient feedback and dialogue in the home when compared to the white middle class child (Blank and Solomon, 1968). Recently these assumptions have been rigorously contested as misconceptions. According to Baratz (1969) instead of readily assessing the ghetto child's language and cognitive development on the basis of widely-held notions and misconceptions, we should be concerned with determining

> "some sense of the ghetto child's culture: how he organizes his world, what his language system is, what his learning patterns are, how they are similar to those of children in middle class white cultures, how they are different, and how these differences interfere with the child's learning in a society that uses white cognitive styles and linguistic patterns as a basis for instruction and assessment of ability."

Thus instead of creating an environment which attempts to duplicate the elements of the white middle class environment, the educator might be wiser to investigate how the ghetto child's speech and language varies in different kinds of communication situations, and then provide the situations which tend to elicit desired speech and language behavior. A dyadic (two person, usually adult-child) situation might not have the same effect on the ghetto child as a white middle class child. Different kinds of communication situations have been shown to elicit various levels of elaborative and abstract responses. It therefore seems appropriate to attempt to determine how different communication situations actually affect the speech and language of "ghetto" children, rather than simply operate on the assumption that what is appropriate for the middle class child's speech and language development is an equally appropriate situation to elicit speech and language for the ghetto child.

One of the critical problems facing educators in enrichment programs is providing situations which stimulate verbalization. In addition to entering compensatory programs with impoverished language, the socioeconomically deprived child also produces little speech. The communication

he does produce relies heavily on gesture, and is often characterized by single words or badly connected words or phrases (Bereiter et al., 1966). Lack of sufficient verbalization can create problems in a compensatory language program, since assessment of language ability and progress with language development are dependent upon the verbal output of the child. It is possible to evaluate some aspects of the child's language by using various language and vocabulary appraisal tests which do not require an oral response such as the Peabody Picture Vocabulary Test (1959). At some point, however, the teacher must work with the child's oral language. It becomes necessary to stimulate speech. It has been shown that failure to provide a situation which stimulates speech may be an important factor in retarding language development (Petty and Starky, 1966). As part of his design for preschool enrichment, Deutsch (1967) emphasized verbalization in his curriculum goals.

In enrichment programs for preschool children, each kind of activity to stimulate speech falls into one of a few basic communication patterns: the dyad (one teacher, one child), the triad (one teacher, two children), the small group (one teacher, three children), the role playing group (teacher as observer or participant, some varying number of children) or the teacher with a larger group.

The literature on the effect of the communication pattern on various variables in the speech and language of children is contradictory and inconclusive. Much of the contradiction and confusion arises from the inconsistency of the assumptions made by the investigators. For example, in some articles the dyad is viewed as an "ideal" situation because it is a mirror of the middle class one-parent-to-one-child environment where the child can be required to use speech, as he is the only one who can respond to the adult's communication (Blank and Solomon, 1968). In an experiment in which socioeconomically deprived children were tutored various amounts per week, it was demonstrated that improvements in the children's performance of abstract thinking could be correlated to the amount of tutoring per week, i.e., the more time the child spent in the dyad, the better he did on measures of abstract thinking (Blank and Solomon, 1968).

The dyadic situation, however, is not always described as successful for generating speech in ghetto children. In one study designed to elicit spontaneous speech in deprived young children, neither a white nor a black examiner was able to elicit any significant amount of spontaneous speech in the children other than one word responses (Hurst and Jones, 1967). A possible reason for these results lies in the suggestion that the dyad is often a mirror of a public school classroom in which the child often plays the role of a listener while the teacher talks and limits the child's responses to single word answers (Bromwich, 1968). A similar finding was reported by the principal investigator in his work with Spanish-American children (Smith, 1969). While the dyadic situation is perceived by some teachers as a model language learning situation, the actual effects of the dyadic communication patterns on speech and language development should be more closely examined and compared to the effects of other communication situations before any conclusions can be drawn.

Groups of children are used more frequently in preschool programs as there is often a large child-adult ratio which makes the use of group instruction or play more practical. The positive characteristics of groups which have been described are the opportunity for more rapid feedback and a greater number of responses from each child (Bereiter and Englemann, 1966). The principal investigator (Smith, 1969) has found that the presence of peers with the authority figure also has some effect on length of the children's responses which make speech and language verbalized in the triad and small group different from the speech and language produced in a dyad. One Head Start program reported that they felt the children enjoyed working in groups, and found that the group activities stimulated verbalizations (Shannon, et al, 1965-66). Two studies which investigated the effects of different communication situations on speech of preschool children showed that the maximum amount of verbal exchange occurred when there were two children and an adult present (Hurst and Jones, 1967) (Williams and Martson, 1942). There are also results to demonstrate that higher levels of language and longer responses were obtained from children when they participated in small groups (Smith, 1969). The effect of group size on speech and language of preschool children should be examined further. The evidence presently available suggests that the optimal communication pattern varies with the age and verbal development of the child.

In many programs for preschool children materials are provided for role playing behavior. Scaled down kitchens with appropriate utensils are typical. Although there are relatively few studies which deal with role-taking skills of younger children, one report indicates that preschool children have difficulty in role playing tasks (Flavell, 1966). There seems to be extremely little research demonstrating the effect of a role playing situation on the children's speech and language. Although young children have considerable difficulty assuming the role of another person, the role situation tends to generate longer verbal responses and language on a higher functional level than other communication situations as demonstrated by the principal investigator (1969) when working with young Spanish speaking migrant children. The children used in that study however were older than the typical "preschool" child and the findings on that population are not generalized to the usual Head Start population. Since situations are created in some of the Head Start programs to elicit role behavior, the effect of role behavior on speech and language of the children should be more fully investigated.

It seems reasonable that further investigation of the effects of different communication situations on the speech and language of Head Start children should be undertaken to aid in the selection of activities which elicit certain kinds of speech and language behavior. It has been shown that the failure to provide a situation which stimulates speech may be an important factor in retarding language development (Petty and Starky, 1966). A survey of the available literature indicates that various communication patterns do display differential effects on the speech and language of various age and cultural levels of children. There has been insufficient research at present, however, to draw any conclusive statements about the specific nature of these interactions.

In designing preschool programs we are faced with the problem of selecting the communication pattern which will maximize the speech of the child. We wish to avoid communication patterns which may suppress verbalization. In actual practice, most educators have held that the dyad--one teacher to one child--is the most perfect communication pattern. Consequently, most preschool programs and the vast majority of elementary school programs strive to maximize the use of the dyadic pattern. This priority naturally places grave strains upon the financial and human resources of such programs. A very significant question arises as to whether, on the basis of the evidence available, the one teacher--one pupil communication pattern produces significantly more speech than the less costly one tacher--many pupils communication patterns.

This study utilized 56 four year old children of the Task Force Head Start Program of Buffalo, New York, in an attempt to shed some light upon the above question. The purposes of the study were two-fold: first, to determine if the mean length of the verbalization of 4 year old children in the Head Start Program varies under different communication patterns. Four communication patterns were used: the dyad, triad, small group and a role-playing triad. The hypotheses tested were:

1. that the mean length of the verbal response of the 4 year old child varies with the communication pattern under which he is asked to respond, and

2. that the mean length of the verbal response of the 4 year old child is significantly greater in the dyad than in the other communication patterns.

The second variable investigated was the interaction of sex with each of the conditions. In research with white middle class children, females are recognized as superior to males on many performance measures. The question of female superiority has been disputed however as some research has not demonstrated advanced female language development (Winitz, 1959). Using socioeconomically deprived children, Anastasi and D'Angelo (1952) found that girls were more linguistically developed than males. Other results (Smith, 1968) showed that firls scored higher on the Peabody Picture Vocabulary Test than five year old males. Alexander (1968), however, found that lower socioeconomic class males tended to exceed girls in the acquisition of linguistic skills. The difference in findings was attributed to the more agressive role the socioeconomically deprived male plays in relation to females in his environment. He has more freedom to seek out peers while the female is often confined to the home. This increased contact with peers produces more verbal contact with others. The second major hypothesis is that:

1. Four year old males will produce longer mean-length verbalizations under all conditions than four year old females in the sample population.

Data for this study was collected in the Task Force Head Start Program in Buffalo, New York, from March 14 through May 6, 1969.

B. Basic Design of Study

This study investigated the effect of communication patterns on stimulation of speech of four year old children participating in a compensatory preschool program. There were two independent variables: communication pattern and sex. The four levels selected for the variable communication patterns were: the dyad (no peers), the triad (one peer), the role playing triad (one peer), and the small group (two peers). Thus the basic design was a 2 x 4 model, with four levels of the factor communication pattern and two levels of the factor sex. Although there was some evidence which suggested that in the ghetto population males surpassed females on verbal measures (Anastasi and D'Angelo, 1952), the experimenter noticed after a brief observation of some of the children used in this study that males did not appear to possess a verbal advantage over the females. The females seemed to be verbally superior to the males. The experimenter made the assumption that because the young preschool females used in this study were allowed to attend Head Start centers, they were probably not comparable to the females confined to their homes in the Anastasi and D'Angelo study (1952).

Two dependent variables were measured. The first dependent variable was the amount of speech produced. Various methods have been used for obtaining quantitative measures of speech: average total number of words produced, amount of speech in a sentence, timed periods of speech, length of response, and mean number of words per pause. There are certain problems with some of these measures however. The average total number of words used in a time period is too variable a phenomenon from child to child (Smith, 1926). Children speak at different rates. The opportunities for stimulating speech from children vary depending on the type of communication pattern. That is, there are theoretically more opportunities for a child to respond in a dyadic situation than in a small group. Rate of speaking and aggressiveness also can affect opportunities.

Smith (1926), McCarthy (1966), Hahn (1948), and Dawe (1943) used mean sentence or response length to measure the amount of speech. There seems to be a potential problem in scoring this type of measure. For example, in working with preschool children it seems unlikely that their responses will always be in complete sentences. If some responses do not fall into the easily identifiable linguistic units we call sentences, how do we classify them? Can we combine mean length measures of sentences with mean length measures of phrases and fragments?

A third measure which has been used to determine amount of speech produced was the time a person speaks (Olson and Koetzle, 1936) (Smith, 1969). Since rate of speaking can confound this measure, misconceptions can occur concerning the amount of verbalization stimulated from each child. If the experimenter does not keep his amount of speaking time constant this can also contribute to contamination of the measure of speaking time.

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Bernstein (1962) measured the amount of speech by determining the mean number of words per pause. Unfortunately when more than one young child is involved in the same situation, there are no real pauses that exist. As soon as one child completes a response and "pauses" another child often begins responding. Thus in this study involving very young children, if Bernstein's method were ulitized, the resultant measure would actually be the mean number of words produced per response.

The amount of speech produced by children in this study was measured by a method similar to Bernstein's (1962) and those measuring the mean length of response and sentences. Since the children did not always speak in complete sentences, the number of words elicited from the child in a communication situation were counted. The number of times the child responded in the situation was also counted. The amount of speech was then calculated by dividing the number of words by the number of responses to measure the mean number of words produced per response. Symbolically, the procedure was: mean length of verbalization = $\frac{\text{total number of words}}{\text{number of responses}}$. This method attempted to reduce concern about variance in response opportunities in the four conditions. This method also seemed to provide a more realistic appraisal of the actual amount of speech elicited per child than the sentence or time measures might have produced from the same population.

After the experimenter had begun recording observations on population for this study, one other factor was identified which seemed to be a potential contaminant of the measure of amount of speech produced. The children seemed to repeat sounds, words and phrases quite frequently. When the children's behavior was compared to the norms for repetition behavior described by Metraux (1950), there seemed to be a much higher rate of repetitions produced than was typical for the children's age level. Based on white middle class norms, by the time children reach 48 months they should repeat mainly for emphasis (Metraux, 1950).

To provide a check for the influence of repetitions on the measure of amount of speech produced a second dependent variable was measured: the amount of speech per response, eliminating repetitions. Since males seem to consistently repeat more than females (Wingate, 1962), it was hypothesized that if repetitions were eliminated from the amount of speech produced, females would still tend to produce more speech than males.

The measure used to obtain values for the second dependent variable was simply an adaptation of the method used to measure the first dependent variable. The number of times the child responded was counted. The experimenter then counted the total amount of words produced. Repetition of words and phrases made by the child were then located. The experimenter subtracted the total number of words in the repetitions produced from the total number of words elicited. The resultant total number of words was divided by the number of responses to produce the measure of mean number of words elicited per response eliminating repetitions. For purposes of this study, a repetition was defined as any word or phrase which was

repeated by the child. Thus if a child responded, "The the ball go with go with the toothbrush," the second "the" and the second "go with" were classified as repetitions and were subtracted from the total number of words produced.

Since the one adult to one child ratio has been described as an ideal learning situation, the research hypotheses were formulated so that the results of the dyadic situations could be compared individually with the results in the other three communication conditions. The research hypotheses were:

1. More speech is produced in the small group situation than in the dyad.

2. More speech is produced in the triad than in the dyad.

3. More speech is produced in the role playing situation than in the dyad.

4. Females produce more speech than males regardless of the communication situation.

5. Eliminating repetitions, more speech is produced in the small group than in the dyad.

6. Eliminating repetitions, more speech is produced in the triad than in the dyad.

7. Eliminating repetitions, more speech is produced in the role playing than in the dyad.

8. Eliminating repetitions, females produce more speech than males regardless of the communication situation.

C. Method of Procedure

The Verbal Task:

The verbal task was adapted from the study of Siegel, Anderson and Shapiro (1966). Regardless of the particular communication pattern used, each S was shown 10 objects, selected from his socioeconomic environment and pretested within the population to insure that the S could identify the object by name. Each S was then asked, "Which of these objects go together?" S's would select from the objects two or more items which they said "went together." The S's were then asked to verbalize in response to the question, "Why do these things go (or belong) together?" The response to why the objects went together was considered the critical response and constituted completion of the verbal task.

The Stimulus Objects:

Twenty objects from the socioeconomic environment of the child were selected to form a pool of stimulus objects. Each object was one with which each S was familiar. The objects were small enough to be handled easily and reflected various shapes, colors, and functions. The specific items used were: artificial apple, socks, sneakers, toothbrush, toothpaste, pencil, crayon, plate, paper napkin, fork, spoon, comb, flower, coke

bottle, cigarettes, soap, key, ball, hat, cup. In order to minimize repetition of the stimulus objects and to maintain subject interest, the 10 objects for presentation were randomly drawn from the pool of 20 stimulus objects for each of the observational conditions.

The Communication Patterns:

Where possible, each S was observed on the verbal task under each of the four communication patterns--the dyad, the triad, the small group, and the role-playing triad. All children at each center participated in one communication situation per day during the week that the E was at their center. The order of communication patterns was randomized over each center so that all children at each center had the same order of communication situations but each center had a different order of situations.

The dyad pattern was comprised of one S and the E. In this pattern the E would sit opposite the S with the objects between them on a table where one was available. The E would ask "What objects go together? Which of these things belong together?" When the S had selected at least two stimulus objects which "went together" the E would ask, "Why do these things go together?" It was assumed that the interchange between S and E would be representative of the diadic relationships normally expressed between E and S or between S and the teacher or the teacher's aid in other classroom activities.

The triad consisted of E and two S's with the task remaining the same as in the dyad.

The small group consisted of E and three S's with the task remaining the same as in the dyad.

In the role-playing triad, two S's were asked to select objects which went together, but the E prefaced this by saying, "Now we are going to go to the store for mommy. Let's see which of these things can go together to help us play like we are going shopping." In cases where there was excessive non-verbal activity, the E would insert verbal probes in an attempt to elicit a verbal response to accompany the non-verbal activity. However, the E was no more active in the role-playing situation than in the other situations.

The Observational Setting:

The study was run in the six neighborhood centers of the Task Force Head Start Program of Buffalo, New York. Each center had between ten and fifteen children who attended regularly. The study was run as an integral part of the day to day routine for one week in each of the centers. In cases where it was possible, auxiliary rooms such as coatrooms, closets or the kitchen were used for data collection. In centers with single rooms, one corner of the room was set aside for the project. In all cases, the data collection was treated by the teacher and the children as an integral part of the daily routine.

The Subjects:

Subjects for this study were selected from the total population in attendance at the six Task Force Head Start centers in Buffalo, New York. The total population in attendance was approximately 79. Although it is more desirable to randomly select subjects, for this study certain potential subjects were intentionally excluded. The children who were not used as subjects included one brain damaged child, one hard of hearing child, one autistic identical twin, and children who were frequently absent due to illnesses. Thus an accidental sample of 56 children from the population was used. Although the sample consisted of 28 males and 28 females, the equal N was also accidental since the number of males and females varied from center to center. The children varied in age from four to five years. Since some children talk more than others (Hare, 1962), individual differences in subjects ordinarily causes considerable contamination of results. To control for individual differences, the same subjects were used across all four conditions.

Data Collection and Scoring

The data for the study were stored on audio-magnetic tapes recorded on portable Wollensak and Ampex tape recorders. The tape recordings containing the speech of all the children in each condition were then transcribed. The experimenter and an assistant transcribed the first four minutes of each observation in each condition. The assitant provided a check on the accuracy of the transcription by the experimenter. One month after the transcriptions were made, the experimenter listened to the tapes again to check the accuracy of the transcriptions. The speech of the children was typed in a manuscript in as close an approximation as possible to the actual speech, pronunciation and grammatical form that the children produced. There was no attempt to classify the responses into sentences or complete responses.

D. Results

Ordinarily, the basic design used to test the eight hypotheses formulated for this study would be a 2 X 4 univariate mixed model with two levels of sex and four levels of communication situations (dyad, triad, small group and role playing triad). A multivariate repeated measures design permits the separation of those aspects of the model due to sampling of subjects from those residing in the outcome variables (Finn, 1969). Because measures were obtained from the same subjects across all conditions, the measures were not independent. Therefore a repeated measures analysis, which accounts for this type of dependency, was more appropriate.

The design used in this study was a one way multivariate model with two levels of the factor sex and four effects (communication patterns) contained in the dependent variables. The region of rejection for hypothesis testing was set at .05.

The first dependent variable examined was the amount of speech per response. Three hypotheses were tested to determine the differences between communication patterns:

1. There is no difference between the amount of speech produced per response in the small group and the amount produced per response in the dyad.

2. There is no difference between the amount of speech produced per response in the triad and the amount produced in the dyad.

3. There is no difference between the amount of speech produced per response in the role playing situation and the amount produced in the dyad.

Only the test of the first hypothesis produced a Step Down F significant at the .05 level (see Table 1). Since the difference between the means in the small group and the dyad was in the predicted direction, the directional hypothesis that children produce more speech in the small group than in the dyad was accepted. Although the test for the second hypothesis was ordered after hypothesis one which produced significant results, reordering the variables for retesting was unnecessary since the correlation between the contrast for hypothesis two and hypothesis one was only -.031.

The test of the fourth hypothesis analyzed the difference between males and females across all conditions.

4. There is no difference between the amount of speech produced by males and females regardless of communication condition.

The Step Down F test of this hypothesis produced results significant at less than .05 (see Table 1). Therefore the null hypothesis was rejected. Since the means for females in all four communication conditions were greater than the means for males (see Table 2), the directional hypothesis was accepted. The lowest mean for males was in the dyad and the highest was in the role playing situation (see Table 2). The lowest mean for females, however, was in the role playing situation and the highest was in the small group (see Table 2).

The second dependent variable analyzed in this study was the amount of speech per response eliminating repetitions. Three hypotheses were tested to determine differences between communication patterns.

5. Eliminating repetitions, there is no difference between the amount of speech per response produced in the small group and the amount of speech produced in the dyad.

6. Eliminating repetitions, there is no difference between the amount of speech produced per response in the dyad and the amount produced in the triad

7. Eliminating repetitions, there is no difference between the amount of speech produced per response in the dyad and the amount produced in the role playing situation.

Only hypothesis five produced a Step Down F significant at .05 (see Table 3).

TABLE 1

Step Down Analysis For Amount of Speech Per Response

Contrast	Error Term	Step Down F	P less than
Small Group-Dyad	4.20	7.5182	.0084
Triad-Dyad	4.61	2.2591	.1388
Role Playing-Dyad	5.32	.7781	.3819
Females-Males	19.45	4.7501	.0337

TABLE 2

Amount of Speech Per Response

Sex		Dyad	Triad	Small Group	Role Playing
Male	Mean	4.630	4.666	4.642	4.713
	St.D.	1.934	1.564	1.931	2.414
Female	Mean	6.112	5.730	6.450	5.497
	St.D.	3.338	4.179	4.175	2.339

TABLE 3

Step Down Analysis For Amount of Speech Per Response Eliminating Repetition

Contrast	Error Term	Step Down F	P less than
Small Group-Dyad	3.90	7.0633	.0105
Triad-Dyad	4.05	2.0626	.1569
Role Playing-Dyad	4.75	.5585	.4583
Female-Male	17.27	4.505	.0385

TABLE 4

Amount of Speech Per Response Eliminating Repetitions

Sex		Dyad	Triad	Small Group	Role Playing
Male	Mean	4.365	4.460	4.477	4.658
	St.D.	1.823	1.441	1.817	2.355
Female	Mean	5.792	5.419	6.121	5.343
	St.D.	3.093	3.997	3.968	2.280

The means for ammount of speech eliminating repetitions in the small group were greater than the means for amount of speech in the dyad (see Table 4). Since the difference between means was in the predicted direction, the directional hypothesis was accepted. Although the sixth hypothesis was tested after hypothesis five which produced significant results, the correlation between the contrasts for hypotheses five and six was only -.044. Therefore, reordering the variable contrasts was unnecessary.

The test of the eighth hypothesis analyzed the difference between the amount of speech produced by males and females in all conditions.

8. Eliminating repetitions, there is no difference between the amount of speech per response produced by males and females regardless of communication pattern.

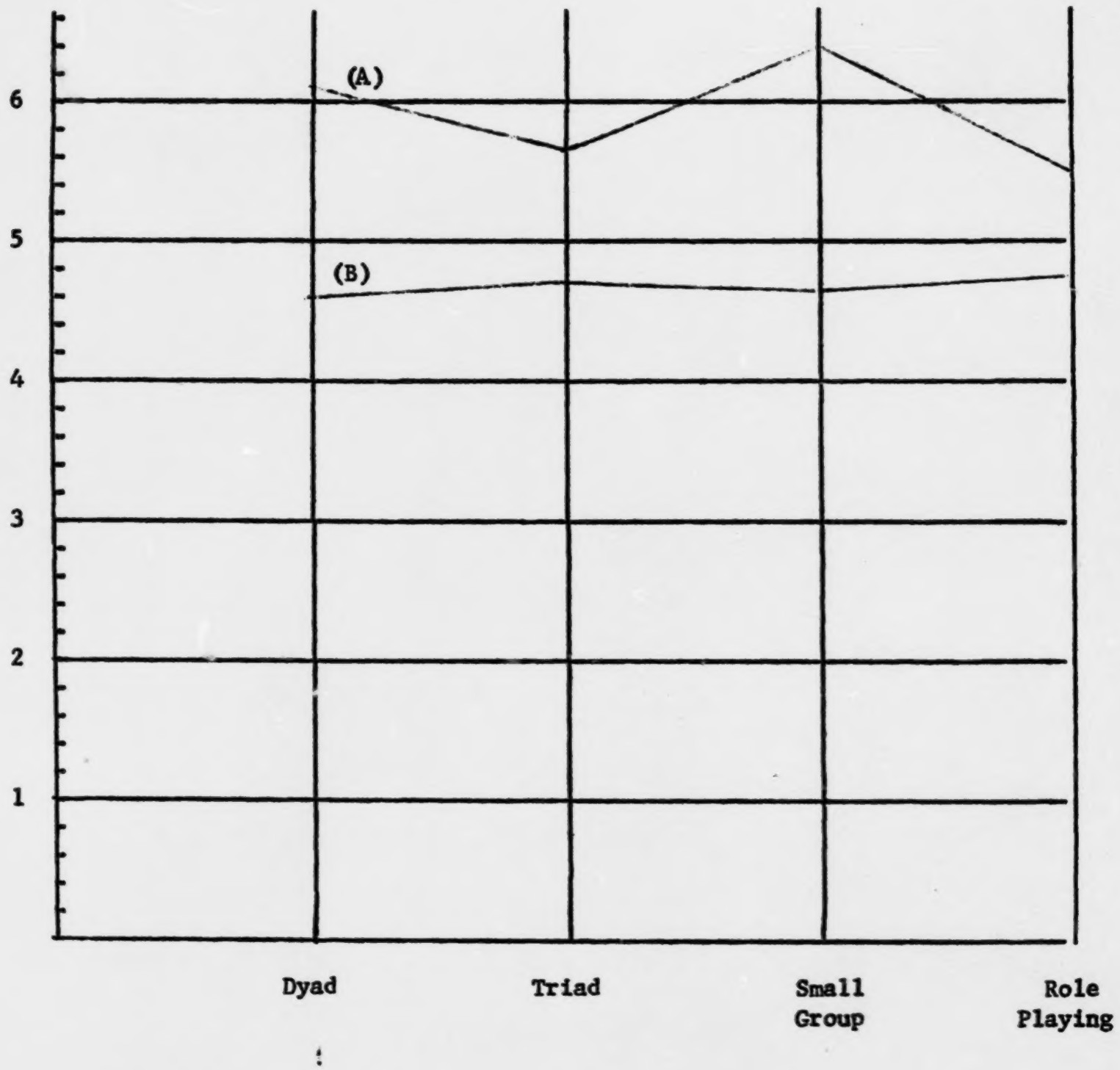
Since the test of this hypothesis produced results significant at less than .05 (see Table 3), the null hypothesis was rejected. The means for females for amount of speech per response eliminating repetitions was greater than the means for males in all conditions (see Table 4). Since the means were in the predicted direction, the alternative hypothesis was accepted. The lowest mean for males was in the dyad and the highest was in the role playing situation. The lowest mean for females, however, was in the role playing and the highest was in the small group (see Table 4).

Although there were some females who produced as few as 2.5 words per response or less, there were females who produced as many as 18 or more words per response (see Appendix A and Appendix B). There was more variability in the scores of females across conditions for both variables than for males. This was evident when the standard deviations were compared for males and females (see Table 2 and Table 4). The wider spread of scores for females was probably due to their wider range of development.

Females produced more speech per response including and eliminating repetitions than males across all conditions. The graphical representations of the means again demonstrated the difference between males and females on both dependent variables (see Figure 1 and Figure 2). Although the difference between males and females was significant for both dependent variables and was apparent in graphical illustration, the differences were rather small. When the difference between means of the first and second dependent variables across all conditions was graphically illustrated, the difference between the means was relatively constant for females. The difference between the means for males was minimal (see Figure 3).

The small group resulted in significantly more speech from the children than was elicited in the dyad situation. This result was probably due to the difference between fhe female means for the small group and the dyad, however, since the difference between the means for males was extremely small.

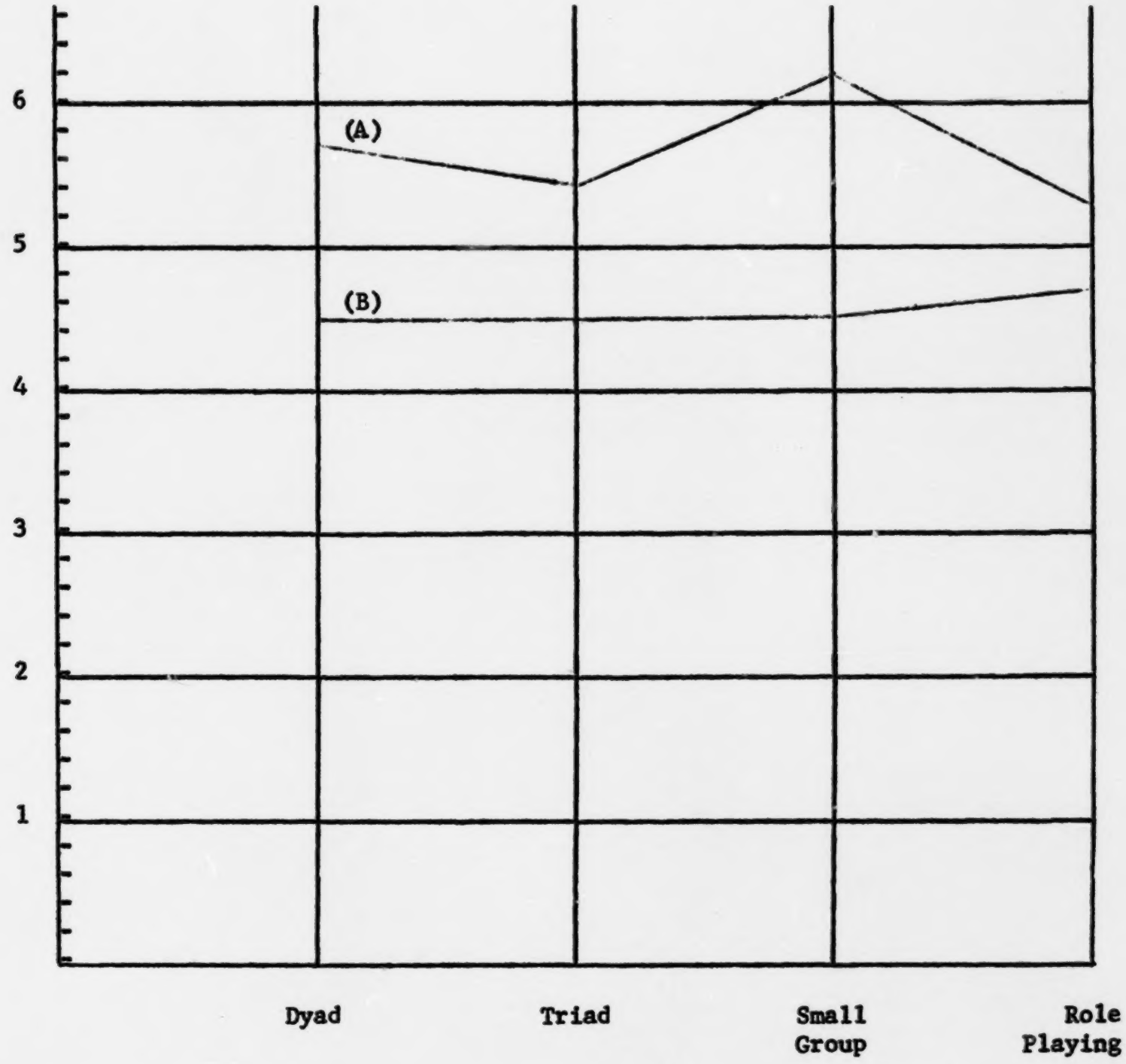
FIGURE 1



(A) ____ = females

(B) ____ = males

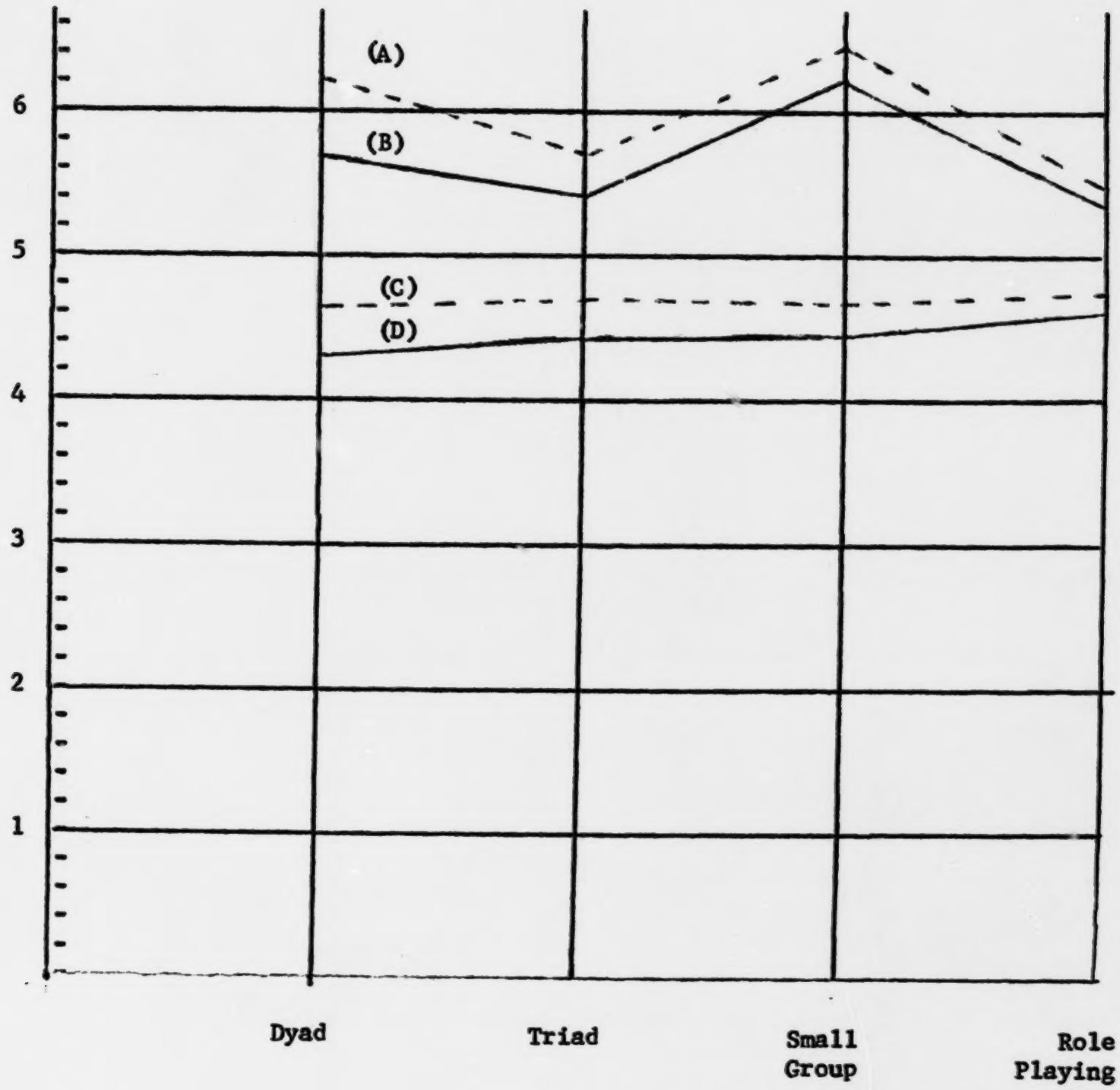
FIGURE 2



(A) ____ = females on second dependent variable

(B) ____ = males on second dependent variable

FIGURE 3



(A) - - - = females on first dependent variable

(B) ____ = females on second dependent variable

(C) - - - = males on first dependent variable

(D) ____ = males on second dependent variable

E. Discussion and Conclusion

It is frequently assumed that the dyadic communication pattern (one teacher-one pupil) is the most effective pattern for stimulating language and speech development among elementary and preschool children. Since the dyadic situation is less economical of a teacher's time than are other communication patterns, it is important to determine whether in fact the dyadic situation is more effective in stimulating speech output. Research has not consistently demonstrated that the dyad is more effective for stimulating speech from preschool children. Bereiter and Englemann (1966) reported that group activity provides for a greater number of responses from disadvantaged children. The study reported here attempted to determine the effects of communication patterns on the amount of speech stimulated by comparing the speech output of Head Start children in dyadic, triadic, small group and role playing situations.

In general, no significant differences were found in the amount of speech produced by children in any of these conditions, except the small group, in which a statistically greater amount of speech was elicited than was elicited in the dyad. When repetitions were eliminated from the children's speech, again a statistically greater amount of speech was elicited in the small group than in the dyad. With and without repetitions, females produced significantly more speech than males.

The dyadic situation did not appear to elicit significantly more verbalization from four year old Head Start children than the other situations. When the small group was compared to the dyad, the small group elicited significantly more speech from the children. Apparently increasing the number of peers to two tended to elicit more speech from each child than when the child was alone with the experimenter. The presence of an authority figure without peers may have been a more threatening situation for some of the children. Some of the children seemed to be inhibited when they were with the experimenter in the dyad. The same children, however, seemed to be far more relaxed when they had two peers with them. Although the difference between the amount of speech elicited in the small group and the dyad was statistically significant, it involved an average of less than one word per response. It is difficult to interpret this difference as large enough to warrant educational change in compensatory programs. It may be important, however, that the dyad did not result in significantly more speech than other conditions, since the dyadic situation is less economical of the teacher's time. This finding is of particular importance to educators in compensatory programs who, because of personnel limitations, rarely can reduce their child-adult ratio below five to one. Thus there is little opportunity in compensatory programs for each child to spend much time in a dyadic situation.

When the triad was compared to the dyad, the amount of speech elicited in the dyad was not significantly different from the amount of speech elicited in the triad. The triad in some instances created a situation in which the two children claimed ownership of the same stimulus items. The single peer in some cases tended to be a competitive threat to the other

child. Consequently, there was considerable non-verbal communication between peers which involved establishing possession of a territory where all the items which "belonged" to one subject were placed. This struggle for possession of stimulus objects seemed to influence the amount of speech produced in the triad. The more the children struggled for possession of the items, the more the amount of non-verbal communication increased and verbal communication decreased. Since the females appeared to be slightly more aggressive than males in the possession battles, it was not surprising to note that females tended to produce slightly more speech in the dyad than in the triad.

The role playing task seemed to be extremely difficult for some of the children and in some cases elicited a simple pattern of speech. For example:

Storekeeper: What you wanta buy?

Customer: This and this

Storekeeper: What else?

Customer: This

Storekeeper: What else?

Customer: This

Storekeeper: What else?

etc.

When the pattern occured as shown above, it created a situation in which the amount of speech elicited was not significantly different from the dyad. Thus, if a role playing task elicited a simple pattern of speech the variety of responses and the amount of speech produced were reduced.

The role playing task itself apparently elicited more non-verbal behavior than the task used in the other three conditions. Although many children did not produce complex verbal responses in the role playing situation, they accompanied their verbalizations with descriptive non-verbal communication. Since a child could point to an object he wanted to buy in the role of the customer, and convey various levels of information without verbally expressing himself, he could rely on non-verbal communication to answer the questions posed by the storekeeper. Thus, another contributing factor to production of speech is the availability of appropriate non-verbal responses.

There was little question concerning the difference between males and females in the amount of speech produced. This difference was probably a major result of the maturation differences between males and females of preschool age. Females produced significantly more speech across all conditions than did males. Many of the females in the sample appeared to be more mature in their physical and mental development. The females often

seemed to be more physically and verbally aggressive. The evidence of female superiority confirmed earlier reports of behavior of white middle class children (Sanstrom, 1968; McCarthy, 1966). Although an earlier study with disadvantaged children reported that males were verbally superior to females on some measures (Anastasi and D'Angelo, 1952), the experimenter made the assumption that because the preschool females used in this study were allowed to attend Head Start centers, they were probably not comparable to the females confined to their homes in the Anastasi and D'Angelo study (1952).

The elimination of repetitions did not change the overall results. The differences between the small group and the dyad and between males and females were again found to be significant. Although repetitions increased the raw scores, eliminating repetitions did not produce enough difference to change the significance of the results of the hypothesis tests. The reason the results did not change was probably because the females did not make significantly more repetitions than males. This was predicted since males have been reported to repeat more than females (Wingate, 1962).

Several factors may have acted as extraneous response determinants in this study. The subjects for this study were not randomly selected. Instead an accidental selection of subjects was made in which all available subjects were used. There was no reason to assume however, that the sampling was biased. The subjects were eliminated only because of physical impairments and illness. Another factor which may have contributed to the results was the dependency of the measures. Since more than one child was measured at one time, the measures obtained in one observation were dependent. That is, the amount of speech produced by one child in a small group is related to the amount produced by other children in the same group. Technically the multivariate repeated measures analysis requires that the measures be independent. This was not a great problem, however, since the measurement of the dependent variable accounted for the dependency of measures by using a ratio formula. The children were measured on the amount of speech per response rather than the total amount of speech produced. Thus the verbal behavior of other children was not a major contaminant of measures.

The Step Down F procedure used in this study seemed rather sensitive to small differences. Although some of the differences were significant, they were too small to warrant change in educational curriculum.

The length of responses elicited may have been influenced by the task used. According to Hahn (1948), when the object or event is shared visually by the speaker and the listener, the sentence length and presumably the response length, need not be as great as in the situation in which the speaker reconstructs an experience. This seemed to be true in all conditions. Since the objects were visible in all communication situations, however, the influence of the task should have been systematic across all conditions.

There were some individual differences among the children in the population which may have contaminated results. The subjects varied from verbally aggressive children to shy quiet children who relied more on gestures than on verbal expressions to communicate. The children's home

lives, according to their teachers, also varied considerably contributing to their various degrees of emotional maturity. Much of this variation should have been cancelled out, however, because the sample was not biased and the children were assigned at random to the various situations.

Replications of this study should be made which attempt to control for extraneous sources of variation. If possible in future research, the subjects should be randomly selected. If random selection and random assignment are used, the assumptions of analysis of variance are not violated concerning randomization, and the experimenter's interpretations of results need not be concerned with justification of violations.

To eliminate problems of dependency, only one child in a triad and small group should be measured from each observation. It is possible to use the same two children as confederates in all small groups and the same child as a confederate in all triads and role playing situations. Using confederates in studies with small children, however, is unrealistic. Randomly selecting children then randomly placing them in four conditions and randomly selecting subjects to measure could avoid using confederates and eliminate problems of dependency.

There should be some control check of the experimenter's responses. Perhaps the experimenter's amount of speech could be measured across conditions to check if the experimenter's behavior in all dyads is relatively consistent and his behavior in triads is consistent, etc.

In future research the amount of speech per response, the amount of time each child speaks, and the amount of speech per sentence should be measured to see if there is a strong positive correlation between the measures of amount of speech before one assumes that they all provide measures of the same behavior.

Although repetitions did not significantly affect the amount of speech produced by males or females, the number of repetitions made by children in the population from this study was far greater than the predicted norms established by Metraux (1950). In future research children from the preschool compensatory programs should be compared to children in suburban preschool programs on repetition behavior. Perhaps the repetitions made were a result of deficient vocabularies since the children often seemed to be searching for words.

The territoriality struggle in the triad condition was not measured in this study. A replication or similar study should be run investigating competition in small groups of children and its influences on interaction.

It is tempting to conclude that a situation in which a large amount of speech is elicited is analogous to finding a situation which elicits more mature language development. Unless the experimenter in future research wants to demonstrate such a relationship, however, measures of amount of speech and level of language maturity should be correlated to determine the direction and intensity of the relationship. Amount of speech is not a measure of language maturity. According to Wood (1968), "Just because the children are 'talking' does not mean that they are 'learning' oral language skills." In

other words if we have demonstrated that children talk more in one situation than another, we have not demonstrated that they have learned additional language skills or have reached another level of language maturity. We can only assert that the children produce more speech.

This study attempted to determine the effect of four communication patterns on the speech of four year old Head Start children. Speech elicited in the triad, small group and role playing conditions was compared to the amount of speech elicited in the dyad. Although there was some potential contaminants of responses, it was evident that the small group elicited more responses with and without repetitions for both males and females than the dyad. The dyad situation did not approach the ideal situation for eliciting speech since it did not differ significantly from the other two conditions, and resulted in less speech than in the small group. The failure to demonstrate that the dyad is superior for stimulating verbalization, however, indicated that the educator in compensation programs need not to be concerned with placing the children in the uneconomical dyadic situation to stimulate verbalizations since the dyad does not result in greater amounts of speech than is elicited in the more economical situations such as the triad or small group.

It was also apparent that females consistently produced more words per response than males across all conditions. This difference was probably due to a difference in maturity level. No conclusions can be made, however, about language. Future research should be concerned with the effects of varying numbers of peers on speech of children, competition behavior and repetition behavior, validation of measures of amount of speech, and establishing relationships between amount of speech and language maturity.

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